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THE ZOOLOGIST:

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OF

NATURAL HISTORY,

FOR

RECORDING FACTS AND ANECDOTES

RELATING TO

QUADRUPEDS BIRDS, REPTILES, FISHES AND INSECTS.

No. CCCXLIII. or S.S. No. 52.

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I write, as usual at this season of the year, to ask you to renew your subscription, that for 1869 having expired, and the works you so kindly ordered having been punctually sent.

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WISDOM OF GOD IN CREATION.

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M.DCCC.LXX.

I love (and have some cause to love) the earth:
She is my Maker's creature, therefore good;
She is my mother, for she gave me birth;
She is my tender nurse; she gives me food.

I love the air: her dainty sweets refresh
My drooping soul, and to new sweets invite me;
Her shrill-mouth'd choir sustain me with their flesh,
And with their polyphonian notes delight me.

I love the sea: she is my fellow-creature,
My careful purveyor; she provides me store.

FRANCIS QUARLES.

BRITISH MUSEUM

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THE ZOOLOGIST

FOR 1870.

On the Natural History and Hunting of the Beaver (Castor canadensis, *Kuhl*) *in Newfoundland; compared with Observations made by Messrs. A. H. Green and Robert Brown, F.R.G.S., on the Pacific Slope of the Rocky Mountains.* By HENRY REEKS, Esq., F.L.S.

IT was not my intention to have written anything on the natural history of the beaver in Newfoundland until I had arrived at its proper place in the systematic list of North American mammals; but I have been induced to do so from having recently read a very interesting paper on this subject by Messrs. Green and Brown, published in the 'Journal of the Linnean Society' for August, 1869. As the observations of these gentlemen differ in some particulars from my own, and believing that such differences are mainly due to climatic influences, or some other cause best known to the beavers themselves, I shall in nowise criticise their remarks, but merely make extracts and compare them with my own notes and observations, which of course I am bound to believe are equally truthful.

Of the beaver in winter Mr. Green says, "Some of the beavers become torpid during January, especially those living near lakes, swamps, or large sheets of water which are frozen. They do not lay in a store of sticks for winter use, as stated by Capt. Bonville (Washington Irving's 'Adventures of Capt. Bonville'), as one day's supply of sticks for a single beaver would fill a house, and if a stick were cut in the autumn before the winter was over it would have lost its sap, and would not be eaten by the beaver." Mr. Brown says, "In winter they have a store of food secured at some convenient distance from their abodes. When they require any they start off to get it. They do not eat there, but bring it to their house, and there make their

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meal." On this subject I find the following remarks in my notebook:—"One remarkable feature in the economy of the beaver is the immense quantity of food it consumes, which must be seen to be appreciated, and this can only be done during the long winter months. At this season we used to trap them through the ice, and consequently had to chop a fresh hole, or rather open the old one, every time we visited our traps, which occurred at intervals of two or three days. On every occasion, as soon as the hole was cut, the 'whittled' sticks were forced into the opening, and we had always to remove nearly a cart-load of these short sticks, from which the bark had been eaten, before we could inspect our traps. The base of the house in the fall of the year is of such large dimensions that I have no doubt much of the wood sunk by mud is used as food during the winter, but the beavers have probably a store elsewhere."

Of the period of gestation Mr. Green writes, it "is known with little certainty, as they are never trapped in summer. The female brings forth some time about the end of June; and it is a year before a beaver is full grown; and even then it has not the *embonpoint* of an elderly beaver. * * * * It produces from three to four at a birth. The teats are placed between the fore legs." Mr. Brown says (the italics are his), "The beaver has from *four to ten young*—most often four, sometimes eight, rarely ten. It carries its young *six months*. It produces *in May*. * * * * Sometimes as many as three generations will remain around the paternal abode." In my notes I find that I have written, "If a beaver's house is undisturbed, the young—two or four, *and even sometimes six?*—do not leave the parents until the second, or perhaps generally the third year, and are then called 'big medlars.' They do not breed until the following May or beginning of June, when they are termed 'old beavers.' The young under one year old are called 'pappoose,' and at two years 'small medlars.'" Mr. Green and Mr. Brown inform us that the young are called "kittens" west of the Rocky Mountains: they are invariably called "pappoose" in Newfoundland.

Of the dam Mr. Green says:—"They begin to build their dams about July or August, as soon as the summer floods begin to subside. For this purpose they generally choose a bend in the stream with high and clayey banks, and commence by felling a large tree that will reach across the water; or they fell a tree on each side of the water so as to meet in the centre. They then float sticks from six to four feet long down to the dam, and lay them horizontally, filling in the spaces with roots, tufts of grass, leaves, and clay or mud. The branches of the first tree are the perpendicular supports, almost all the remaining sticks being placed horizontally and crosswise. The last six or eight inches in height is very insecurely constructed, being nothing but mud and leaves. The highest dam I ever saw was only about four feet six inches; but the generality of them are not above two or three feet. The action of the water, by bringing down mud, gravel or fallen leaves, strengthens the dam by making a sloping bank against it; and the willow sticks of which it is composed sending forth their roots and shoots, the dam in course of time becomes a fixture bound together as strongly as well could be. The winter floods almost invariably destroy the upper part of the dam, which is reconstructed afresh every year. The shape of the dam is almost always semicircular, with the crown of the arch down stream, thus reversing the order of things; but I have no doubt this is in consequence of the heads of the first or principal trees being floated down stream when they are first thrown."

Mr. Brown does not add much on this subject, but says, "The dams here, as everywhere else, are perfectly constructed, and with an opening in the middle for the current. * * * * Large trees are universally felled so as to fall with the head to land, because, if required for floating down, the branches would impede it being floated off, while the difficulty of dragging it down is not so great, over and above the fact of the impeding branches being easily gnawed off. Much ingenuity is displayed to effect the fall of the tree in the proper position. I have often, in my walks and sails along the solitary rivers of the western wilds, seen three or four beavers piloting a large tree down stream, and noticed that when they were approaching its destination they shoved it into the eddies inshore."

My own experience differs, and in my notes I have thus expressed myself:—"I must here correct what I take to be an error of some authors, *viz.*, that the beaver in making its dam usually selects a situation where a tree by being cut down will fall across the brook, and thereby greatly assist in damming, or, as it is termed in Newfoundland, 'stenting' the water. To the closet naturalist and those unable or unwilling to substantiate it, or prove otherwise, all this reads very pretty and interesting, but to the practical naturalist it is a mere fable, at least as far as my own experience goes, and that of the many Indians and settlers that I have questioned on the subject: but I will limit my observations to my own experience, which I think quite sufficient to prove the contrary,—at least that such throwing of trees is the exception and by no means the rule.* My first residence in Newfoundland was on the banks of a good-sized lake, some ten miles long by two miles wide. This lake is surrounded almost entirely by woods, and is fed by several muddy streams—the favourite resort of beavers, and here as well as in many other places (for beavers were exceedingly plentiful) I had abundant opportunities for studying their economy. I observed that they invariably selected a muddy brook the banks of which were well studded with alder-bushes, small birch and willow, the stems and small branches of which are used in conjunction with roots of grass and plenty of mud, in forming the dam, and also in building their house. The stems and branches are usually cut into lengths of from two to four feet, the ends of which are stuck firmly in the mud; other branches and short sticks are then allowed to drift down the stream to the 'stent,' and are then sunk to the bottom by piling mud on them: this process is usually commenced when the water is at its lowest, and is continued until the brook is 'stented' sufficient for the economy of the beaver. The 'stent' is somewhat horse-shoe shaped, with the bow or arch pointing down stream, and so firmly is it constructed that it usually formed my bridge across these muddy and consequently dangerous brooks for wading. Often when tired and tolerably well laden with gun and dead birds have I blundered through the thick alder-bushes, sometimes knee-deep in water in search of the welcome 'stent.' During the spring and fall floods the beavers regulate the depth of water in their houses, as in fact they do at all seasons, by the 'stent,' for such indeed is its purpose, and so sensible are the animals of the slightest variation in the stream that shortly after a breach is made, if otherwise undisturbed, one or more beavers venture from the house to repair the damage, and often meet their deaths from the fatal gun while doing so."

Of the houses themselves Mr. Green tells us they "are formed of water-logged sticks placed horizontally in the water. They have always two or more entrances, and a small chamber with a little grass for the beaver to lie on. The top of the house is constructed very thick, to guard against attacks by animals. Mud and roots are used to make the house solid; but no mud is seen from the outside, as the top is covered with loose sticks left there by the beaver after taking the bark off. The houses are generally about four feet in height, and about six in diameter on the outside, and would hold about four beavers, though I have known small houses to hold two only. * * * * The beaver also burrows into the banks of streams, always taking care to have two entrances, one under (or close to) the water, and a smaller air-hole on land."

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* Captain Hardy fully bears out this assertion: *vide* "Forest Life in Acadia," pp. 172—174.

Mr. Brown says:—"The house has two flats: the bottom one is on a level with the water; the top one is used to sleep in, and has communication with the water through the bottom. The top one has direct communication with the land. * * * * In regard to the beavers' houses, I am forced to come to the conclusion either that travellers who have written regarding the beaver in the country east of the Rocky Mountains have woefully taken advantage of a traveller's license, have listened to mere hearsay wonders without seeing for themselves, or that the habits of the beaver differ much in different parts of the country.

"It is only after they have been pointed out to you that the 'houses' can be recognized, as they seem like loose bundles of sticks lying on the water.* In a recent account of the beaver in the British provinces in North America by an anonymous writer,† the houses are described as being exactly the same as I have seen them in the West, and not plastered domes. * * * * Sometimes they live in merely a tunnel or cave. In winter the Indians go along the edge of the ice, sounding with a stick; and wherever there is the opening of one of these tunnels, the sound being different, he watches and plugs up the opening."

The beaver houses with which I was familiar in Newfoundland, and which, at certain seasons of the year, I saw almost daily, were built as Mr. Green described them, but in many cases of very much larger dimensions. Some winter houses I have known to be twelve or even fourteen feet in diameter (outside measure), and at least six or seven feet high. The inside diameter was probably not more than five or six feet, so solid are the walls and roof, although no mud is visible from the outside. These large houses often hold from eight to twelve, or even, though rarely, sixteen beavers. Beavers usually have two houses: a summer house and winter house: the former is generally situated near the mouth of the brook, as the food of the beavers during the summer months consists in a great measure of the stems and roots of the pond lily* (*Nuphar advena*, Aiton), which is called "beaver root" by the settlers. In the fall of the year the beavers generally migrate up-stream to a more favourable situation for procuring a supply of winter food; and as soon as the house is rebuilt or repaired, these industrious animals are very assiduous in cutting down small birch and willow, on the bark of which they subsist in winter. Although birch trees as large as a man's thigh are frequently cut down, the beavers appear only to make use of the smaller branches, which are cut into suitable lengths and carried to the house, around which they are sunk by means of mud, to be used as food after the brook is frozen over. Until this takes place the beavers feed on the land, or on browse collected on the top of the house. Every house appears to have two passages from the exterior to the interior, which are termed "angles" by the natives. Whilst the winter house is building the beavers frequently live in a deep hole in the bank: this domicile, *pro tem.*, is called a "hovel."

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* Mr. Brown says in a foot-note that "the 'house' in the Zoological Gardens, London, corresponds with this description."

† 'Land and Water,' March, 1868.

In trapping the beaver the same devices appear to be employed both east and west of the Rocky Mountains. Mr. Green informs us that "the traps generally used in securing the beaver are large steel traps with a strong spring at each end, and fastened with a chain, from four to six feet long, to a pole, which is stuck in the bottom of the water as far out as the chain will allow, so that the beaver, when he feels the trap, may run into deep water, and as he gets tired, the weight of trap taking him down, he drowns. A beaver, when trapped, never tries to get to land, but makes a dive for the deepest water, and should the water be shallower than four feet, he will, in a short time, amputate his foot so as to relieve himself. He always takes his foot off at a joint, and draws the sinews out of his shoulder, instead of biting them through. * * * * A beaver is generally caught by his fore foot, and should the trap be set too deep below water his toe-nail only gets caught. The trap is set in the beaver-run, or just where it springs into a hole in the bank. It must not be set in too shallow water, for then he amputates his foot, or in too deep, for in that case he does not get caught at all, but swims over the trap. The proper depth to set a trap is five inches. The beaver is then caught by his fore foot. * * * * A full-grown beaver weighs about thirty-four pounds. * * * * A good skin will weigh two and a half pounds; but it is very rarely that one weighing that amount is caught in Vancouver Island. The Hudson's Bay Company give only from seventy-five to eighty-five cents per pound at Victoria for peltries, so that a trapper now-a-days cannot get very fat at the work."

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* Mr. Green alludes to the beavers feeding on this plant and also on alder (*Alnus oregana*), but I never could find a "whittled" alder stick, although alder is sometimes largely used in building the "stent."

Mr. Brown says:—"In trapping, some strong-smelling stuff (commonly castoreum in rum or cinnamon) is spread on the path. The trap is then set in the water close to the bank, and covered with about four inches of water. The beaver, attracted by the strong-smelling substance, gives an approving slap of his tail, and starts off, if anywhere in the neighbourhood, to investigate the booty, and as he is leaving the water, gives a "purchase," so as to spring up the bank on the very place where the trap is concealed. * * * * The Opicheshaht (Indians) approach to leeward at night, and spear the beaver from a canoe as he floats, eating a branch taken from the shore; or they shoot him when in shallow water, but not in deep water, as he sinks on receiving the shot. They also block up the opening into his house, break through the wall, and shoot or spear him. * * * * When beaver [fur] was thirty shillings per pound, Rocky Mountain beavers [skins of] were piled up on each side of a trade gun until they were on a level with the muzzle, and this was the price! The muskets cost in England some fifteen shillings."

The same rascally advantage was also taken of the Mic-Mac Indians in Newfoundland, but such ill-gotten wealth has rarely prospered among the settlers of that island. The following notes on hunting and trapping the beaver were penned during my residence in Newfoundland. This interesting animal may still be said to be common in Newfoundland, although great numbers are annually caught by the settlers, and even more by the Indians. The latter live almost entirely by the produce of their beaver fur: one Indian alone told me that he had caught and taken to St. John's, during the previous year (1866) no less than two hundredweight of beaver fur. As the Indians begin beaver-catching too early in the fall, before the fur is of sufficient length or thickness, it must have taken at least two hundred beavers to produce this weight of fur!

The Indians are great adepts in "drawing" beaver. This is done by removing part of the stent, or dam, and concealing themselves afterwards on the leeward side of the brook, near the house, or very frequently near the "stent," until the beavers come out to repair the broken dam, when they are easily shot. If "drawing" be determined on it must be done very noiselessly, or the beavers will not leave the house, which they will otherwise generally do on finding that the water is falling too rapidly. If the beavers are long in making their appearance at the "stent" another plan is resorted to, which, although of more trouble to the hunter, is generally more certain of success. The beavers have usually two passages leading into the house, which are termed "angles" by the trappers: these, which are under water, have to be found out and carefully barred by driving stout stakes into the mud at the opening of each passage, which effectually cuts off the retreat of the beavers: the house is then chopped open at the top and the inmates either shot or knocked on the head with a tomahawk.

The settlers usually catch them in strong iron traps, such as are used for catching foxes. These have to be set with great care, as the beaver, if not immediately drowned by the weight of the trap keeping it under water, will soon "cut out"—*i. e.* gnaw off its leg. To catch a beaver by the fore leg the trap is placed either four or five inches under water, and to catch it by the hind leg it must be either eight or nine inches under water. In either case the trap must be placed on the side of the house, and the stake, to which the trap is fastened, must be driven into the mud as far from the bottom of the house as the trapper can reach, so as to prevent the beaver carrying the trap on to the top of the house above water. If all this is carefully attended to there is not much fear of success, for the beaver as soon as trapped endeavours to get the trap above water, but failing in this tries to drag the trap into the house, at the bottom of which the chain becomes entangled and the poor animal is soon drowned.

On the other hand want of care not only lacks success, but must entail great misery on the beavers themselves. I well remember on one occasion a settler visiting his traps and finding that he had taken a leg each from seven different beavers, but this, I have no doubt, was not entirely the fault of the trapper, who was an "old hand," as the rivers in Newfoundland fall and rise so rapidly in the spring and fall, that it is sometimes almost impossible to keep the trap always the same depth under water. I have known the traps repeatedly thrown by the beavers pressing a short stick on the pan, but this may have occurred either designedly or accidentally. Mr. Brown gives an anecdote of the sagacity of the beaver, which I here introduce. He says:—"In a creek about four miles above the mouth of Quesnelle River, in British Columbia, some miners broke down a dam, in the course of the operation for making a ditch, at the same time erecting a wheel to force up the water. Beavers abounded on this stream, and found themselves much inconvenienced by these proceedings. Accordingly, it is said that, in order to stop the wheel, the beavers placed a stick between the flappers in such a way as to stop the revolutions of the wheel. This was so continually repeated night after night, and was so artfully performed as to preclude the possibility of its being accidental."

The dried skin of an old beaver, *if caught in good season*, will frequently weigh two pounds.

In the good old trapping days, when beaver fur sold for a guinea a pound, it was not much trouble for some of the few English settlers to make money—however dishonest the practice: it was only necessary to take four or five gallons of rum, which could be bought of the American and Nova-Scotian traders at less than a dollar a gallon, and adulterate it with one-third water, and carry it into the country to the wigwams of the Indians, who would gladly exchange the skin of an old beaver, worth nearly two guineas, for a pint of rum! I am happy to say the Indians are far more sensible now, and take their fur to a much better market, although, unfortunately for them, it is not worth more than a quarter so much at the present day.

HENRY REEKS.

Thruxton, Andover.

[In order to bring this interesting subject more fully before the readers of the 'Zoologist,' I have thought it best, even though incurring the necessity of considerable repitition, to reprint from the 'Journal of the Linnean Society' (Vol. x., p. 361), the whole of the excellent papers to which Mr. Reeks has referred.—*E. Newman.*]

On the Natural History and Hunting of the Beaver (Castor canadensis, *Kuhl*) *on the Pacific Slope of the Rocky Mountains*, by ASHDOWN H. GREEN, Esq. *With Supplementary Notes by* ROBERT BROWN, Esq., F.R.G.S. (Communicated by JAMES MURIE, M.D., F.L.S.)

[Read November 5, 1868.]

I HAVE been for three years almost constantly engaged in trapping beavers, so that what remarks I may have to make on their habits and history, though somewhat at variance with the stereotyped notions prevalent in compilations, are yet the result of my own independent observations.

About January their tracks may be seen in the snow near the outlet of the lakes where young fir trees grow. At this time they prefer young fir trees as food to any other kind of tree, the reason, doubtless, being that at this period the sap has not risen in the willow or alder (*Alnus oregana*). It is not often that females are caught in the spring; and the males seem to travel about, as the runs are not used so regularly as they are when the beavers are living near.

Some of the beavers become torpid during January, especially those living near lakes, swamps, or large sheets of water which are frozen. They do not lay in a store of sticks for winter use as stated by Capt. Bonville (Washington Irving's 'Adventures of Capt. Bonville'), as one day's supply of sticks for a single beaver would fill a house—and if a stick were cut in the autumn, before the winter was over it would have lost its sap, and would not be eaten by the beaver. A beaver never eats the bark of a tree that is dead, though he may gnaw a hard piece of wood to keep his teeth down. A little grass is generally found in the houses, but is used as a bed and not for food.

If February is an open month, the beavers begin to come out of their retreats, and frequent any running water near them; but it is generally March before the bulk of them come out of winter-quarters. When they come out they are lean; but their furs are still good, and continue so till the middle of May—though if a trapper thought of revisiting the place, he would not trap after April, so as to allow them to breed quietly.

About the end of March the beaver begins to "call." Both males and females "call" and answer one another. Sometimes on one "calling," half-a-dozen will answer from different parts of the lake. I have known beavers to "call" as late as August. Males fight during the rutting-season most fiercely. Hardly a skin is without scars; and large pieces are often bitten out of their tails. The beaver holds like a bull-dog, but does not snap. It shakes its head so as to tear. When trapped, it will face a man, dodge a stick, and then seize it, taking chips out of it at every bite. It seems to attack from behind.

The period of gestation is known with little certainty, as they are never trapped in summer. The female brings forth some time about the end of June; and it is a year before a beaver is full-grown; and even then it has not the *embonpoint* of an elderly beaver.

I have read that the beaver breeds at any time during the year; but this cannot be, or all the kittens that are trapped in the fall would not be of the same size. It produces from three to four at a birth. The teats are placed between the fore legs. The young (called kittens) whimper like young puppies when suckling, even when two months old. The females prefer deep sedgy lakes to bring their young up in, and they feed on grass about that time of the year (July or August). They feed on willow about April, May and June. I cannot say whether they are born blind or not, but suspect so. They are very fond of water-lilies (*Nuphar advena*, Ait.) in the spring. It is with me a matter of uncertainty whether the female litters in a house, under the ground, or in the dry sedges; but I should think, under ground or in the houses. In the autumn more females are caught than males. Trapping commences in September and continues to May; after that the trappers leave them alone, so that I do not know much about their doings in the summer.

They begin to build their dams about July or August, as soon as the summer floods begin to subside. For this purpose they generally choose a bend in the stream, with high and clayey banks, and commence by felling a large tree that will reach across the water; or they fell a tree on each side of the water so as to meet in the centre. They then float sticks from six to four feet long down to the dam, and lay them horizontally, filling in the spaces with roots, tufts of grass, leaves, and clay or mud. The branches of the first tree are the perpendicular supports, almost all the remaining sticks being placed horizontally and crosswise. The last six or eight inches in height is very insecurely constructed, being nothing but mud and leaves.

The highest dam I ever saw was only about four feet six inches; but the generality of them are not above two or three feet. The action of the water by bringing down mud, gravel, or fallen leaves, strengthens the dam by making a sloping bank against it; and, the willow sticks of which it is composed sending forth their roots and shoots, the dam in course of time becomes a fixture bound together as strongly as well could be. The winter floods almost invariably destroy the upper part of the dam, which is reconstructed afresh every year. The shape of the dam is almost always semicircular, with the crown of the arch down stream, thus reversing the order of things; but I have no doubt this is in consequence of the heads of the first or principal trees being floated down stream when they are first thrown. The body of water raised by these dams varies, of course, according to the fall of the original stream, from a small hole of twenty feet diameter to a lake of miles in length. In the former case the beaver builds his house close to the dam, so as to get depth of water, and there saves himself from any hungry panther (*Felis concolor*, L.) or wolf who might feel inclined to indulge in beaver-meat. The beaver also burrows into the banks of streams, always taking care to have two entrances, one under (or close to) the water, and a smaller air-hole on land. With a good dog, capital sport may be had on some of the smaller rivulets leading into or out of a lake. The houses are formed of water-logged sticks placed horizontally in the water. They have always two or more entrances, and a small chamber with a little grass for the beaver to lie on. The top of the house is constructed very thick, to guard against attacks by animals. Mud and roots are used to make the house solid; but no mud is seen from the outside, as the top is covered with loose sticks left there by the beaver after taking the bark off. The houses are generally about four feet in height, and about six in diameter on the outside, and would hold about four beavers, though I have known small houses to hold two only.

The traps generally used in securing the beaver are large steel traps with a strong spring at each end, and fastened with a chain, from four to six feet long, to a pole, which is stuck in the bottom of the water as far out as the chain will allow, so that the beaver, when he feels the trap, may run into deep water; and as he gets tired, the weight of trap taking him down, he drowns. A beaver, when trapped, never tries to get to land, but makes a dive for the deepest water; and should the water be shallower than four feet, he will, in a short time, amputate his foot so as to relieve himself. He always takes his foot off at a joint, and draws the sinews out of his shoulder instead of biting them through. The stump heals up; and I think the beaver is none the worse for it, though he gets shy, and, perhaps, tells the other beavers to beware of traps. A beaver is generally caught by his fore foot; and should the trap be set too deep below water, his toe-nail only gets caught. The trap is set in the beaver-run, or just where it springs into a hole in the bank. It must not be set in too shallow water, for then he amputates his foot,—or in too deep, for in that case he does not get caught at all, but swims over the trap. The proper depth to set a trap is five inches. The beaver is then caught by his fore foot. Sometimes the teeth of a beaver are found to have grown beyond their proper length. I once saw one with the lower teeth three and a half inches beyond the gums. He was caught in a trap, and was miserably thin; but, singularly enough, he had about the finest fur I ever saw. He was an aged animal. It is rare to see a beaver which has been trapped with its teeth whole, as they are often broken in trying to get out of the trap. A full-grown beaver weighs about thirty-four pounds. I am not an anatomist; but still I do not think there is anything very peculiar about its internal structure,* except that the heart weighs a mere nothing—the cavities being so very large. An old beaver when shot sinks, a kitten floats. A good skin will weigh two and a half pounds; but it is very rarely that one weighing that amount is caught in Vancouver Island. The Hudson's Bay Company give only from seventy-five to eighty-five cents per pound at Victoria for peltries, so that a trapper now-a-days cannot get very fat at the work. There are at present very few beavers on either Vancouver Island or the mainland, compared with what there must have been some years ago; but they have been increasing for the last six years; and no doubt by the time beaver-skins come into fashion again there will be a plentiful supply.

Supplementary Notes by Mr. Brown.

The following I add as an Appendix to the foregoing observations of my friend Mr. Green, whose opportunities for studying the animal were much superior to my own during my travels in North-west America, and whose account is valuable as being the plain unvarnished notes of a hunter—a narration of facts very familiar to him, written with no reference to preconceived notions or received theories. First, therefore, regarding the range of the beaver. It is found all over British Columbia, Oregon, Washington Territory, and even south to California and north to the limit of trees. It is not, however, found, as far as I can learn, in the Queen Charlotte Islands, but is abundant in Vancouver Island, though, curiously enough (in such a manner is history written) Colonel Colquhoun Grant, in his 'Description of Vancouver Island' (Journal of the Royal Geographical Society, vol. xxvii. p. 268), mentions that he has seen traces, and was not aware that the animal itself had been found. The fact of the matter is, he could have found abundance not far from his own door. Near Victoria, in Mr. Yales's Swamp, and in one near Dr. Tolmie's, are several beavers; and on the road to Cadborough Bay there are, in a small stream near where the road crosses, the remains of an old dam. In the interior they are almost everywhere abundant and on the increase. In a swampy lake near the mouth of the Cowichan Lake we found many; and an extensive swamp near the entrance of the Puntledge Lake was a great stronghold. On Young's Creek,* flowing into the same lake, were many dams. In the spring of 1866, when crossing the island from Fort Rupert to the head of Quatseeno Sound with some Indians, a great portion of our route lay among these beaver-ponds and dams. All through this district beavers swarm. The camps of the Indians were full of them; and the women laid before us the daintiest pieces of the meat, or exhibited to their white visitor all sorts of curiosities in the shape of fœtal beavers and beaver's teeth, with which they were gambling, using marked ones in much the same manner as our dice. At the Hudson Bay Company's Fort we lived upon beaver during that spring—beaver roasted and beaver broiled; beaver tail and beaver joint; beaver morning, noon and night. In regard to the beavers' houses, I am forced to come to the conclusion either that travellers who have written regarding the beaver in the country east of the Rocky Mountains have woefully taken advantage of a traveller's license, have listened to mere hearsay wonders without seeing for themselves, or that the habits of the beaver differ much in different parts of the country.

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* *Vide* Cleland, Edin. New Phil. Journal, new series, vol. xiii. (1860) pp. 14—20.

It is only after they have been pointed out to you that the "houses" can be recognized, as they seem like loose bundles of sticks lying on the water.† In a recent account of the beaver in the British provinces in South America by an anonymous writer‡, the houses are described as being exactly the same as I have seen them in the West, and not plastered domes. The vigilance of the little builders is so great that it is rarely, unless closely watched for a long time, that they can be seen. A passing traveller rarely surprises them at their work.

My friend Mr. John Tod, chief trader in the Hon. Hudson's Bay Company's service during a long residence at Fort M'Leod (a post of that Fur Company, situated in the northern portion of British Columbia), has communicated to me his observations, which, differing in some respects, substantiate in the main those of Mr. Green. The beaver has from *four to ten young*—most often four, sometimes eight, rarely ten. It carries its young *six months*. It produces *in May*. When the female is going to have young the male takes the young of last year (for sometimes as many as three generations will remain around the paternal abode), and goes up a river several miles, remaining there until the female has produced.

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* See the author's map and the memoir *Das Innere der Vancouver Insel* in Petermann's *Geographische Mittheilungen*, 1869, S. 87.

† The "house" in the Zoological Gardens, London, corresponds with this description.

‡ 'Land and Water,' March, 1868.

The dams here, as everywhere else, are perfectly constructed, and with an opening in the middle for the current. The only approach to plastering their houses which I have observed is its giving a self-satisfied "clap" of the tail on its laying down its load.* The loads are carried between the top of the fore paws and the under surface of the head. The trailing of the tail along the ground gives the vicinity the appearance of being plastered. The house has two flats: the bottom one is on a level with the water; the top one is used to sleep in, and has communication with the water through the bottom. The top one has direct communication with the land. Sometimes they live in merely a tunnel or cave. In winter the Indians go along the edge of the ice, sounding with a stick; and wherever there is the opening of one of these tunnels, the sound being different, he watches and plugs up the opening. If these holes or tunnels are used as escapes from the houses, they break into the latter. If the beaver is not in, the Indian makes a hole in the ice. He then makes a great noise, and watches the rippling of the water to see if he is there, because his motion will have that effect. When alarmed he generally rushes for his hole; and finding it closed, he is often shot in his endeavour to escape. In *trapping*, some strong-smelling stuff (commonly castoreum in rum or cinammon) is spread on the path. The trap is then set in the water close to the bank, and covered with about four inches of water. The beaver, attracted by the strong-smelling substance, gives an approving slap of his tail, and starts off, if anywhere in the neighbourhood, to investigate the booty; and as he is leaving the water, gives a "purchase," so as to spring up the bank on the very place where the trap is concealed. His food is principally willows. The bark is preferred, though the wood is eaten when nothing else can be got. It will gnaw through thick trees, apparently for the top foliage; for immediately the tree falls the beavers spring on the branches of it. A stump showing beaver-gnawing is not unlike Indian chopping (small irregular chops); and novices in the back woods often mistake them for Indian "sign." Large trees are universally felled so as to fall with the head to land, because, if required for floating down, the branches would impede it being floated off, while the difficulty of dragging it down is not so great, over and above the fact of the impeding branches being easily gnawed off. Much ingenuity is displayed to effect the fall of the tree in the proper position. I have often, in my walks and sails along the solitary rivers of the western wilds, seen three or four beavers piloting a large tree down stream, and noticed that when they were approaching its destination they shoved it into the eddies inshore. They always cut down the trees *above* their lodges, never on any occasion *below*. In winter *they have a store of food secured at some convenient distance from their abodes.* When they require any they start off to get it. They do not eat there, but bring it to their house, and there make their meal. Of the almost human intelligence of the "thinking beaver" the stories are innumerable; but many of them are much exaggerated, or even fabulous (such as Buffon's account). The following is tolerably well authenticated, my informants vouching for the accuracy of it. In a creek about four miles above the mouth of Quesnelle River, in British Columbia, some miners broke down a dam, in the course of the operation for making a ditch, at the same time erecting a wheel to force up the water. Beavers abounded on this stream, and found themselves much inconvenienced by these proceedings. Accordingly, it is said that, in order to stop the wheel, the beavers placed a stick between the flappers in such a way as to stop the revolutions of the wheel. This was so continually repeated night after night, and was so artfully performed, as to preclude the possibility of its being accidental.

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* On this point *vide* A. Murray, Edin. New Phil. Journal (1859), vol. ix. (n. s.) p. 216.

In "Notes on the Habits of the Beaver," presented to the Royal Physical Society by Mr. James K'Kenzie*, of the Hudson Bay Company's Service, and to all appearance most careful and trustworthy, details are given differing somewhat from those related by Messrs. Green (in the foregoing paper) and Tod.

When I lived among the Opicheshaht Indians, at the head of the Alberni Canal~~, V. I.~~, I heard much about *Attoh*, the beaver, but remarkably little to the credit of its sagacity. They look upon it as rather a common-place animal, requiring no particular skill to trap. They used to tell us all sorts of stories about it, but I think they all contain a vein of fiction. Mr. G. M. Sproat has gathered some of this information into his excellent 'Scenes and Studies of Savage Life,' to which I refer. The beavers lie in these houses, as the Indian expresses it, "like boys," but when the female has young ones she goes into a separate bed or chamber, I could not ascertain which. There is no story in a beaver-house for convenience of change in case of floods; the waste-way is generally sufficient to carry off any extraordinary quantity of water. In the Alberni country, at least, the houses on the banks of lakes are abandoned when the water is very high; and the beavers go to small streams, which they form into a succession of diminutive lakes; in these they breed*. He sleeps during the day, and comes out at night to feed. He cannot see far, but he is keen of scent. The Opicheshaht approach to leeward at night, and spear the beaver from a canoe as he floats eating a branch taken from the shore; or they shoot him when he is in shallow water, but not in deep water, as he sinks on receiving the shot. They also block up the opening to his house, break through the wall, and shoot or spear him.

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* Proceedings of the Royal Physical Society, Session 1861-62, and Edin. New Phil. Journal, vol. xv. pp. 299—302.

The flesh of the beaver, especially when first smoked and then roasted, is not at all unwelcome as an article of food. The tail, when boiled, is a noted article of trappers' luxury, though, forsooth, if the truth must be told, rather gristly and fat, and rather too much for the stomach of any one but a north-western hunter or explorer. "He is a devil of a fellow," they say on the Rocky Mountain slopes; "he can eat two beavers' tails!" The scrapings of a beaver's skin form one of the strongest descriptions of glue. The Indians at Fort M'Leod's Lake use it to paint their paddles; and the water does not seem to affect it.

When beaver was thirty shillings per pound Rocky Mountain beavers were piled up on each side of a trade gun until they were on a level with the muzzle, and this was the price! The muskets cost in England some fifteen shillings. These were the days of the "free trapper,"—joyous, brave, generous, and reckless,—the hero of romance, round whom many a tale of daring circles, the love of the Indian damsel, the beau ideal of a man, in the eyes of the half-breed, whose ambition never rose higher than a *coureur des bois*—a class of men who, with all their failings, we cannot but be sorry to see disappearing from the fur-countries. The fall of beavers' peltry rang their death-knell; and, as a separate profession, trapping is almost extinct, being nearly altogether followed, at uncertain spells, by the Indians and the lower class of half-breeds. The world is fast filling in; the emigrant, with his bullock-team and his plough, is fast destroying all the romance of the far West—fast filling up with the stern prose of the plough and the reaping-machine and the whistle of steam what was once only claimed by the pleasant poetry of the songs of the *voyageur*, the *coureur des bois*—the hunters and trappers of the great companies! But perhaps it is better after all!

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* Sproat, *lib. cit.* 249.

The beaver is easily domesticated, and learns to eat any vegetable matter, but requires water occasionally. One kept at Fort M'Leod got blind; but if it got access to water, it laved some on its eyes, and generally in an hour quite recovered its sight. It used to gather carpenter's shavings together, and carry them to the door: if the door was shot, it forced them up against it, finishing with a slap of its tail, as if it were building a dam. It had a great antipathy to the Indians. It would come into the Indian Hall, where the natives were seated, as is their wont, back to the wall. It would first take their fire-bag, then their axe, and so on until it had carried everything to the door, greatly to the amusement of the Indians. It would then attempt vigorously to eject the owner of the articles. Its "weakness" for gnawing exhibited itself in a very unpleasant manner; for occasionally, in the morning, the whole of the furniture was prostrate, the beaver having gnawed through the legs of the tables and chairs!

This leads me to remark that the beaver might be easily naturalized again in Britain; and though I cannot recommend them in the light of a drawing-room pet, yet I can conceive no more pleasant inhabitant of our lakes and rivers.[*] We must remember that at one time the beaver was an inhabitant of these islands, but became early extinct.

This was, of course, not the Castor Canadensis, but the C. fiber, *Linn.*; for the remains found in Britain, have now been decided to belong to the latter species, which is, I believe, not yet altogether extinct in Scandinavia.[†] We have, however, historical accounts of its former abundance in this country; and I cannot better conclude these desultory notices than by recapitulating the information we possess regarding it as a former inhabitant of the British Isles, referring for a more particular account of it as a Scottish animal, extinct within historic periods, to Dr. Charles Wilson's 'Researches on Castoreum and the Beaver in Scotland.' The earliest notice of it we know is in the ninth century, viz., in the Welsh Laws of Hywel

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[*] *Vide* 'Farmer,' April, 1868.

[†] Nilsson: Skandinavisk Fauna, Första Delen, *Daggdjuren*, ss. 400–427.

Dha,* where we read of it even then as a rare or valued animal of the chase; for while the marten's skin is valued at twenty-four pence, the otter's at only twelve pence, that of the llosdlydan, or beaver, is valued at the great sum of one hundred and twenty pence, or at five times the price of the marten's, or ten times the price of the otter's. It thus seems, even in the times of the Heptarchy, to have been on the decrease; its sun had early begun to set. In the year 1158 Giraldus de Barri (or as he is variously called, Sylvester Giraldus or Giraldus Cambriensis), in his droll account of the itineration he made through Wales, in company with Baldwin, Archbishop of Canterbury (who journeyed thither in order to stir up the Welsh to join in the Crusades, and who afterwards followed the train of Richard Cœur de Leon, and fell before Acre), tells us that in his day it was only found on the river Teivi, in Cardiganshire, and gives a curious account of its habits, derived in part from his own observations. In John Ray's time many of the places in the naighbourhood of the river bore the name of *Llynyrafrange*, or the Beaver Lake, and, for all we know to the contrary, may to this day. About the same time it was probably known in Scotland, but only as a rare animal. Hector Boece (or Boethius, as his name has been Latinized), that shrewd old father of Scottish historians, enumerates the *fibri*, or beavers, with perfect confidence as among the inhabitants of Loch Ness, whose fur was in request for exportation towards the close of the fifteenth century; and he even goes further, and talks of an "incomparable number," though perhaps he may be only availing himself of a privilege which moderns have taken the liberty of granting to mediæval authors when dealing with curious facts. Bellenden, in a translation of Boethius's "Croniklis of Scotland,' which he undertook, at the request of James VI., about the middle of the sixteenth century, while omitting stags, roe-deer and even otters, in his anxiety for accuracy, mentions "bevers," without the slightest hesitation:—"*Many wyld hors and amang yame are mony martrikis* (Pine Martens), *bevers, quhitredis* (Weasels) *and toddis* (Foxes): *the furrings and skynnis of thame are coft* (bought) *with gret price amang uncouth* (foreign) *merchandis*." It is, however, more than probable that the worthy historians were influenced by a little national pride when they recorded the beaver as an inhabitant of Loch Ness in the fifteenth century, as no mention is made of it in an Act dated June, 1424, though *Martricks, Fourmartes* (Polecats), *Otters*, and *Toddis* are specified. They were perhaps so strongly impressed by the wide-spread tradition of its existence in former days, as to be led to enumerate it among the animals of Scotland in those times; and it may be mentioned in passing that both worthies boast immoderately of the productions of their country. At the beginning of this century (at least) the Highlanders of Scotland had a peculiar name for the animal—Losleathan or Dobhran losleathan, "the Broad-tailed Otter." According to Dr. Stuart, of Luss, in a letter to the late Dr. Neill, quoted by Prof. Fleming,* a tradition used to exist that the beaver or "Broad-tailed Otter," once abounded in Lochaber. That may be so or not; but at all events it does not now exist anywhere within the bounds of the British islands; and a considerable doubt might be still thrown on the accounts of the old writers, were not remains continually dug up in all parts of the country. I would fain hope that in a few years it may again be an inhabitant of our lakes and rivers.

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* Leges Wallicæ.

In these scattered notes I have not attempted anything like a systematic history of the animal, leaving the separate accounts to tell their own tales. No more pleasing work could, however, be written than a Monograph of the beaver, anatomically and historically; and I trust that before long it may be undertaken by some one at once an artist and a naturalist.†

On the Immigration of the Gray Phalarope (Phalaropus fulicarius) *and the Recent Occurrence of this Species in Sussex.*

By J. E. HARTING, Esq., F.L.S., F.Z.S. ‡

OF late years ornithologists have noticed a marked increase in the occurrence in Great Britain of certain northern birds which are usually considered rare or accidental visitants to this country. It may be said that the published reports of an increased and increasing number of naturalists have led to this conclusion; and to a certain extent doubtless this is so. Nevertheless, individual observers who have been carrying on investigations for years in the same locality have remarked that, while certain species in their neighbourhood are becoming annually scarcer, certain others are becoming more numerous. Nor has this substitution, so to say, of one species for another, been remarked by ornithologists only. Botanists and entomologists have similar testimony to advance. Indeed, when we consider the gradual but important changes which are taking place in the soil itself, we can scarcely wonder that the species existing thereon should be likewise affected.

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* Edin. Phil. Journ. 1838.

† (This wish has been in some respects anticipated in a volume, 'The American Beaver and his Works,' by Lewis H. Morgan: Philadelphia, 1868. It had not fallen into Mr. Brown's or my hands when this paper was read.—J. MURIE.)

‡ Extracted from 'The Field' of November 13, 1869: communicated by the author.

I have been led to these reflections from having recently seen on the Sussex coast several examples of the gray phalarope (*Phalaropus fulicarius*), a bird which, nesting in Iceland, and visiting this country in autumn, has of late years been more than usually common at that season of the year.

On reading the various reports which have been published in connection with the occurrence of this species in England, the following interesting facts may be elicited: first, these little birds come to us in the autumn, generally arriving during the early part of September; secondly, the direction in which they migrate appears to be from the north-east to the south-west, as shown by their being most frequently found in the south-eastern and southern counties of England; thirdly, a great proportion of them are birds of the year, as is the case with the majority of our shore birds, which pass northwards through this country in spring and return again in autumn with their young; fourthly, they do not as a rule remain with us throughout the winter, but pass on further south; fifthly, those which return to their northern haunts in the spring do not return by the same route, and I do not remember any instance in which the species has been obtained in England in the breeding plumage; sixthly, during their stay in this country they evince a partiality for the neighbourhood of fresh water pools, ponds and dykes, in preference to the sea-shore on which they first alight.

We have yet to ascertain in what latitudes the gray phalarope is most numerous in winter, and by what route it returns northwards to its breeding-ground.

During the autumn of 1866 a vast number of gray phalaropes were seen and shot in the south-eastern and southern counties of England. So numerous indeed were they, that Mr. J. H. Gurney, jun., in a pamphlet on the subject, published a summary of the occurrences, with the dates of observation, of more than five hundred individuals. As regards these birds, however, that year was an exceptional one.

Severe gales from the north-east had prevailed at the date of the autumnal migration, and icebergs had travelled further south than they had ever been known to do previously. These facts must be considered if we endeavour to account for the westerly direction which was taken by the great body of migrants in their flight towards the south.

Since that date no similar immigration has been observed, although several reports have been subsequently published touching the appearance of this species here in autumn.

During the latter part of September last, while shooting at Pagham Harbour, on the Sussex coast, I had several opportunities of studying this beautiful little bird in a state of nature, and of noting the character of its food, flight and actions in the water. I saw four individuals at different times and places, and shot three of them. My brother saw a fourth. A fifth was brought to me recently killed, and three others were sent to Brighton to be preserved. The occurrence of so many examples within so limited an area would lead one to expect a repetition of what occurred in the autumn of 1866; and, by way of contributing, therefore, to other reports which may appear on the subject, I now transcribe from my note-book an account of what I myself observed.

On the 21st of September, while walking between Siddlesham and Selsea, at a short distance from the sea, a gray phalarope suddenly rose close to me from a small dyke. It flew very slowly, and, being anxious to see something of its actions, I did not shoot at it, but endeavoured to mark it down in one of the numerous creeks which intersect the harbour at low water. In this I was disappointed, for, in spite of a long search, I could not find it again. To make quite sure that I had not mistaken the species, I returned to the dyke from which I had disturbed it, and searched along the soft margin for the foot-prints. Surely enough there was the impression of the unmistakable lobed foot, like that of the little coot, upon the mud.

On the 22nd of September my brother saw a gray phalarope at Wall End, not far from the coastguard station. On the 23rd of September I proceeded to the same spot, with the hope of finding the same bird again, and shot one, probably the same, at a pool of brackish water just inside the sea-wall.

The following day I revisited this pool, and, while walking in the neighbourhood, saw a gray phalarope flying towards me from the sea.

It alighted on a little island of mud in the pool, and I had a good opportunity of watching its movements for some time. On walking towards it with the intention of shooting it, it flew across the pool, when I fired, but unfortunately only wounded it, and it got away. The next morning, however, my brother found it dead on the beach, not far off. To judge by its having both tarsi broken, and a bad shot wound in the vent, it could not long have survived the shot. It is always distressing to a naturalist, when in pursuit of a bird, to fail in his purpose and let it escape wounded; he would far rather not shoot at it at all. But the powder is not always "straight!" On the 20th of September I devoted the entire day to a search for this species in the numerous broad dykes which intersect the country between Siddlesham and Selsea, knowing that, from its partiality for fresh water, it would more probably be found inland than on the sea-shore. I walked many a mile of dykes without seeing anything but a kingfisher, until at length, on turning a corner, I caught sight of a gray phalarope swimming in the water, about forty yards ahead. By making a *détour* and crawling carefully on hands and knees, I was enabled to get very close to it, and, peering through the grass on the edge of the dyke, could watch every movement of the graceful little bird. In its manner of swimming round and about, now and then pecking at some water-weed, it seemed to resemble the Gallinules, like them nodding the head at every stroke of the foot. When standing on the ground at a little distance, it looked not unlike a ringed plover, but at this season of the year it was much whiter. It rose once, and flew a little way down the dyke, when it alighted on the water again, and commenced swimming as before. On the wing it reminded me of the young of the black tern. After I had watched it for some time, I was cruel enough to shoot it, just as it was leaving the dyke. It fell out in the field on the opposite side, and I was punished with a severe wetting in endeavouring to jump across. The bird, however, was secured, and I was enabled to satisfy myself of the nature of its food, which I found to consist of small flies and beetles, with the admixture of a little vegetable matter which I could not determine. This confirmed what I had remarked in two other specimens examined.

J. E. HARTING.

Ornithological Notes from North Lincolnshire.

By JOHN CORDEAUX, Esq.

(Continued from Zool. S. S. 1908).

OCTOBER AND NOVEMBER, 1869.

Shorteared Owl.—October 1. This species is a regular visitant on our coast in the autumn. The beaters put up several this morning from a swampy patch near the middle of one of the "beck" plantations.

Wild Geese.—October 5. First large flock of wild geese observed: they were travelling due north. More geese have crossed this district during the month than has now been the case for many years. They take nearly the same line towards the N.N.W. or N., and this has been their course all through October.

> "Hawnk! honk! and for'ard to the nor'ard, is the trumpet tone."

And let those predict who choose a hard and severe winter; this, for some time to come at least, portends mild and pleasant weather.

Stonechat.—October 5 to 20. Several seen on the Humber embankment and in the marsh, all immature birds; are probably arrivals from the north. This species is rarely met with in this district excepting during the autumn, and occasionally in the winter months. I saw several on the Spurn sand-hills on the 11th.

Starling.—October 5. There can, I think, be no doubt that we have large arrivals of this species on this coast in the early autumn: they migrate during the night, and at this season no bird is more frequently dashed to death against the Spurn lights than the starling: the same is the case at Flamborough. On one thick night in the early part of this month the Spurn lantern-top was crowded with a noisy flock of these birds alighting there. Two immense flocks arrived in the marsh about the last week in September, infinitely more than could possibly have been reared in this district: these remained till the middle of October. I one day endeavoured to make a rough estimate of the number of birds composing the larger of these flocks: on the wing, and flying in close order, they appeared to occupy a space about half a mile in length, forty yards in breadth and twenty deep: on alighting they covered nearly seven acres of ground. The beating of so many small wings resembles the pattering of a heavy thunder shower amongst the leaves of a thick wood, or the recoil of a great wave from a beach of pebbles.

Hooded Crow.—October 8. First arrivals on the coast. I am inclined to think these birds come across in the day: when on the coast I have seen them, in the afternoon, coming in overhead in a direction from the sea, and also, when at sea, observed flocks passing over towards the land.

Little Crake.—October 9. I am certain I saw this rarity in a patch of reeds near the "beck" this afternoon: I was so close to the bird that I could not have shot without blowing it to atoms. My dog chased it into the reeds, where I only just missed capturing it by hand.

Jack Snipe.—October 9. First seen.

Redstart.—October 15. A single bird seen, a mature male—a very late appearance.

Woodcock.—We have had both an early and large arrival of cocks: an odd bird or two seen as early as the last week in September. On the night of the 18th of October there was a terrific north-easter, strewing our Lincolnshire coast with wrecks, and destroying much life and property: in the morning the woodcocks were found along the coast in considerable numbers. On the 26th there was another fierce and destructive gale from the N.W., and on that and the following mornings great numbers of cocks were shot all along our eastern coast, one well-known sportsman bagging seventeen couple, and thirty-five couple are recorded as killed along five to six miles of coast. Those I have shot are fine birds and excessively fat. They are plentiful in the game-shops, and selling at about five shillings the couple. With reference to the remarks which have lately appeared in the papers respecting the migrations of these birds, an experience of many years leads me irresistibly to the conclusions that the winds which drive the woodcock to our coast are those blowing from N.W. to E.; that the stronger the gale from between these points the more likely we are to have good sport and find birds; that this species invariably migrates with the wind, and not against it, or with a favourable side-wind, but it should not have too much west in it; and that they never come with the wind in the south and west. As a rule those birds shot on this coast are excessively fat and in high condition, although we occasionally meet with a striking exception.

Snow Bunting.—October 19. Small flocks seen on the stubbles and on the Humber embankment; also at Spurn on the 11th.

Larks.—October 19 to 25. Immense flocks arrived between these dates in the marshes, and may now be found by hundreds in all the stubbles. At this season I have frequently, when on the coast, seen small straggling flocks of this species coming in from the sea, and also at night, when out at sea, recognised their familiar note. The lark, like the starling, is often picked up dead under our east coast light-houses.

Golden Plover.—October 26. Heavy gale from the N.W., with frost and snow. First flocks of golden plover seen in the marshes, but none between this date and the 10th of November, when we had a return of frost and some heavy snow squalls. On the 11th, from early morning till late in the afternoon, flock after flock of the golden and green plovers passed across this parish, flying from S.E. to N.W., at the average height of two hundred yards. Often two or three flocks were in sight at the same time, and there was rarely five minutes interval between them. The two species were never intermixed, each flock keeping distinct, which is the case when travelling to any distance, and this, I am convinced, was no ordinary change of feeding ground, but a general movement to some other part of the country. These flocks were of all sizes, from five birds up to many hundreds. Throughout the day incredible numbers of both these species passed over the marsh, so as to be the general subject of remark. This movement did not appear to be confined to the plover, for I noticed during the day hundreds of hooded crows, also dunlin, snipe and curlew, all travelling in the same direction. I have occasionally in past years noticed a like movement of wild fowl towards the N.W., and find that this movement is as certainly followed by mild and open weather as that their passage southward indicates frost and snow.

Gray Wagtail.—October 29. First observed. This graceful and lively species is this season most plentiful.

Missel Thrush.—October 29. I believe we have a very considerable addition to all our resident Merulinæ in the autumn, coming either from the northern counties or the continent: of these the missel thrushes are the earliest, arriving from the latter part of August to early in September. This autumn these flocks have been both large and numerous. Now from the middle to the end of September we always find thrushes more or less plentifully in our marsh turnip-fields—a district where, I need scarcely remark, from the absence of trees and shrubs, a thrush is a rarity at any other season. Later still, the first fortnight in October, are the blackbirds: for every blackbird found in this parish in the latter summer there is now fully four. I put them up from all sorts of odd places: on the Humber bank, the sides of marsh drains, and on the higher lands, amongst the hedgerows and plantations, they swarm. Of these three species the missel and common thrushes do not remain in the district, but I do not observe any diminution in the blackbirds.

Graylag Goose.—November 1. Observed seven graylags pitch in one of our marsh pastures this afternoon, and in a favourable position for stalking: to drop into the nearest drain was a matter of necessity: a deep cold wade up this and along a cross drain, and a wriggle, snake-like, across a dirty cattle-trodden gatestead brought me to the place. I found, however, to my sorrow, that the birds had shifted their ground and walked to the middle of the field: the only chance left was to match legs against wings, and by running rapidly towards them trust to a long shot: this I did, and pulled at the gray-blue shoulders of the hindmost only to hear the shot strike the feathers.

Fieldfare and Redwing.—November 9. First observed. Like the thrushes the redwings on their first arrival will often resort for some days to the turnip-fields.

JOHN CORDEAUX.

Great Cotes, Ulceby, Lincolnshire,
November 26, 1869.

Hedgehog and Rabbit.—I was rather surprised to see, in Mr. Gunn's "Notes on the Mammalia of Norfolk," a most absurd tale about a hedgehog, given on the authority of a gamekeeper. This harmless little animal is strictly nocturnal in its habits, and from its structure is unable to spring at anything, and it could not possibly retain its hold of a struggling rabbit if it ventured to attack one, which I do not believe that any hedgehog ever did.—*Henry Doubleday; Epping, November* 15, 1869.

[I quite agree with Mr. Doubleday that such tales ought not to be given on the authority of gamekeepers, who are the last people in the world to observe accurately or with unprejudiced eyes.—*Edward Newman.*]

Otter near Ipswich.—A friend assures me that, whilst travelling between Baalham and Stowmarket, on Thursday, the 11th of November, he saw from the railway, which runs for some distance close to the river Gipping, an otter: it was at some distance from the bank, snuffing about much in the manner of a ferret, and took no notice of the train: having seen the otter before, in the West of England, he was not likely to be mistaken. This makes the third occurrence of this rare animal that has come under my notice during eighteen months. Two young ones were caught during a flood in the locks at Great Blakenham, about seven miles from Ipswich, in July, 1868; and a full-grown specimen was killed by some bargemen on the river at Sproughton, some time early in this spring: this is only three miles from Ipswich. I have heard it stated that others breed in this neighbourhood, and the second occurrence I have mentioned seems to give some weight to the supposition.—*H. M. Wallis; Ipswich, November* 11, 1869.

The Australian Wild Horse.—The wild horse of Australia will unquestionably at no distant date, like the mustang of the South American pampas, occupy in vast numbers the almost boundless plains of the interior. On the South Australian border, in Victoria, where some few years ago wild horses were comparatively few in number, large herds are now to be found. During periods of continual drought these herds travel immense distances in search of pasture, and on some stations detract considerably from the value of the runs to the north-west. The neighbourhood of the mallee scrub at the present season appears to be a favourite resort for wild horses. Feeding on the plains in mobs of from fifteen to thirty mares with colts at foot, the sire, a stallion whose progeny are usually of one colour, is most careful of his family, on the slightest alarm leading his charge at full speed under shelter of the almost impenetrable scrub. Several successful musterings of these steeds of the plain have been made of late, we are informed, and some of the colts broken in and sent to market, but, from the cheapness of horse-flesh all over the colony, the speculation has not paid. Many hundreds have been shot on the various stations, but apparently without reducing their numbers. Wild cattle in the neighbourhood of the mallee scrub have also become a complete nuisance. On the sheep stations beef of excellent quality is supplied all the year round as rations to the men employed. The wild cattle are hunted like the buffalo on the North American plains, and are said to be gradually increasing in numbers and spreading towards the Far North. The most astonishing circumstance attaching to these wild herds of cattle and horses is that, notwithstanding on the stations near their haunts sheep and other stock are dying very fast from the effects of the drought, these denizens of the plain appear in excellent health and sleek as moles. A most beautiful sight it is to see a large mob of wild horses startled on the plains, galloping at full speed, their unkempt manes floating in the wind, the speed of which they seem to equal; their tails sweeping the ground—they present to the eye a perfect embodiment of beauty and freedom.—*Adelaide Observer.*

Occurrence of the Common Kite in Cornwall.—A very fine adult specimen of the common kite was obtained from the grounds of Trebartha Hall, near Launceston, on the 1st of December. I have not heard of a specimen of this beautiful bird occurring anywhere in the West of England for the last fifty years, although I have a vague recollection of the species having (in my school-boy days, at Buckpostleigh, near Ashburton, in Devonshire) regularly bred in a large woodland, called "King's Wood," not far from Holne Chase, on Dartmoor. My nephew saw this bird to great advantage soaring with his forked tail in full relief against the sky: it had been observed feeding on carrion for some days at the kennel; and previous to this my nephew observed and reported to me, a large brown hawk which he observed on the extensive moors in the neighbourhood, and which he said appeared at a distance to be all tail: this no doubt was the kite.—*Edward Hearle Rodd; Penzance, December* 2, 1869.

Hen Harrier in Suffolk.—An adult female was shot near Wangford on the 10th of October, and sent me for preservation.—*T. E. Gunn; Regent Street, Norwich.*

Robin eating Ladybirds.—Mr. Cordeaux, writing of the late immigration of ladybirds (S. S. 1922), states he does not think birds eat them, as he has not found that any of our common species do so, such as the rook, starling, sparrow, &c. I have, however, found this to be the case with the robin, as on the 7th of November last I opened the stomach of a robin, accidentally caught in a gin set for rats, and found amongst other things the remains of at least two ladybirds, the hind wings of one so nearly perfect that it must have been almost the last thing eaten.—*Cecil Smith; Lydeard House, near Taunton.*

Food of the Tits.—There is probably a mistake in the statement, published in the 'Field' newspaper (see Zool. S. S. 1927), that cole tits (*Parus ater*) have attacked the filberts growing near London: this species does not congregate, and is principally found in woods and plantations of firs, to which trees it is especially partial. I think it very likely that the great tit (*P. major*) sometimes perforates the shells of nuts, like the nuthatch, for the sake of the kernel, as this species is very fond of the seeds of the yew, which it dexterously holds in its claws, and breaks the shell by repeated strokes of the beak. I now see and hear them daily doing this in my garden, and the ground is strewed with the shells of the seeds. The young birds are very fond of green peas, and often severely injure the crop, but they also destroy large numbers of the caterpillars of the common cabbage butterfly (*Pieris Brassicæ*). The blue tit (*P. cæruleus*) is very fond of cherries, and also of apples and pears, and often does great injury to the crops. I never saw the other British species attack any kind of fruit, but the marsh tit (*P. palustris*) is very partial to the seeds of the common sunflower.—*Henry Doubleday.*

Snow Bunting at Aldeburgh.—During the week before last I saw a flock of snow buntings at Aldeburgh: several were killed at the same time by a medical gentleman of that town.—*H. M. Wallis.*

Buff Variety of House Sparrow.—A buff-coloured variety of the house sparrow (*Fringilla domestica*) was shot in this neighbourhood during October last.—*T. E. Gunn.*

Immigration of Rooks.—The residents of Aldeburgh have lately observed large flocks of the common rook arriving in company with other migrants: the gamekeepers of the neighbourhood have noticed the same occurrence, and are quite clear that the birds seen were not the Royston or gray crow. I did not know that rooks either came to or left this country.—*H. M. Wallis.*

Late appearance of the Swift.—This afternoon I saw a swift (*Cypselus apus*) flying over the city of Chester: it was evidently hunting for food, as it circled round and round in its flight. During the summer the swift is most abundant in Chester, but they left two months ago.—*H. W. Feilden; Chester Castle, November* 16, 1869.

Pale Variety of the Common Partridge.—A very pale variety of the common partridge, a female, was shot at Stratton, near Norwich, on the 5th of November, and brought me for preservation.—*T. E. Gunn.*

Golden Plover on the Dove.—Numbers of the common and golden plovers have frequented for some time the banks of the Dove, and we are expecting they will be followed by a severe winter: the snow is now lying on the ground to the depth of two inches.—*Oswald Mosley; Rolleston Hall, Burton-on-Trent, December* 2, 1869.

Scarce Ducks in Torquay.—The following ducks were offered for sale in Torquay on the 2nd of December, on which day I examined them, but only found the last fresh enough for stuffing:—a fine male gadwall, an adult female shoveller, a goldeneye and a smew (both adult females). I regret not to be able to give the localities where these birds were shot.—*A. de Hügel; Florian, Torquay.*

Great Northern Diver at Burton-on-Trent.—On the 29th of November a fine specimen of the northern diver found its way from the Trent and Dove up our small brook into the centre of our village, where of course it met with a speedy death, and is now in the hands of Mr. Franklin, a birdstuffer at Birmingham, for preservation, to be placed in my museum.—*Oswald Mosley; Rolleston Hall, Burton-on-Trent.*

The Mummy Specimen of Alca impennis at Halifax, Nova Scotia.—In the 'Zoologist' for October (S. S. 1835) I read with surprise, in a foot-note appended to Mr. H. Reeks' account of the Birds of Newfoundland, the announcement that the mummy specimen of Alca impennis presented to me by the Bishop of Newfoundland in 1864 "was originally intended to have been sent to Professor Newton." As this statement is incorrect, I should feel obliged by your allowing me to insert an extract from the Bishop's letter accompanying his generous and highly valued present, which affords sufficient explanation of the circumstance:—"I have the pleasure of sending you by Dr. Gilpin a very perfect skeleton of the great auk or northern penguin. I had intended it for Professor Owen, as it is a much better specimen than the one I sent to Mr. Newton; but I willingly leave the disposal of it to you, as you judge best for the gratification and edification of naturalists, and osteologists in particular." In compliance with his lordship's wishes I immediately forwarded it to the national collection, where I trust it will prove none the less serviceable to Science than if had been presented to Prof. Newton.—*J. Matthew Jones, President Institute of Natural Science; Halifax, Nova Scotia, November* 5, 1869.

The Great Auk.—I am obliged to Mr. Reeks for setting me right about the Funk Island great auk. The mistake was not exactly of my making: the sentence "Found by the Bishop of Newfoundland while on a missionary cruise at Funk Island," was inserted by a friend who was kind enough to look over my MS.—*J. H. Gurney, jun.;* 14, *Alpha Road, Regent's Park.*

Great Auk's Eggs in Edinburgh.—On visiting the Museum of Science and Art in Edinburgh, some short time ago, I was much surprised to find, amongst numerous others, two fine eggs of Alca impennis. This note may be of interest to some of the readers of the 'Zoologist,' as, so far as I know, these eggs have not been inserted in any published list. I see these eggs have been noticed in the July number of the 'Ibis' for 1869 (p. 358), by Capt. H. W. Feilden.—*A. de Hügel; November* 22, 1869.

Voracity of the Cormorant.—A cormorant, shot in Torbay, on the 24th of November last, was found, on being skinned by Mr. Shopland, the Tor naturalist, to contain in its throat a conger eel, which I measured, and found to be no less than two feet and a half in length. Except that its head was much bruised, probably by the cormorant in killing it, the fish was not otherwise hurt.—*Id.*

Little Gull on the Norfolk Coast.—Two examples of the little gull, in immature plumage, were shot on the coast near Salthouse on the 22nd of October: one of the above, which I preserved, proved on dissection to be a female: it weighed three ounces and a quarter.—*T. E. Gunn.*

Fulmar Petrel, Little Auk and Gray Phalarope in Somersetshire.—A fulmar petrel was shot on our coast, near Stolford, on the 26th of October: the skin was brought to me a few days afterwards: the plumage is rather different from either of those mentioned by Yarrell, and from the one mentioned by me in the 'Zoologist' for 1866 (S. S. 562), as the whole of the head, neck and breast are gray, nearly like the back; the eyes were unfortunately taken out when the skin was given to me. The little auk was picked up dead on the mud, about the same time, but was unfortunately thrown away as being too muddy for preservation. The gray phalarope was picked up dead, but quite fresh, at Hestercombe, near Taunton, about the end of September: it was in the ordinary plumage of those found in England about that time of year.—*Cecil Smith.*

Fulmar Petrel on the Norfolk Coast.—A friend brought me a female specimen of the fulmar petrel that had been shot the previous day at Yarmouth. The bird was rather thin, its skin being infested with parasites of apparently two kinds, one a small black species, the other rather an enormous creature; of the latter I found six and several immature specimens; the adults were of a deep brown colour, with transverse lines of white on the body: the large parasites died about two days after the bird, but the black species lived until the fifth day. The bird weighed eighteen ounces: the stomach was empty, with the exception of an inch of tar rope, rather a singular item. The fulmar petrel is of somewhat rare occurrence on this coast.—*T. E. Gunn; November 6, 1869.*

Abundance of the Storm Petrel in Norfolk.—The little storm petrel has been quite abundant in Norfolk during the last week or two. I have had as many as seven specimens brought me for preservation: they were half starved, and were either dead or in a dying state when picked up, and their stomachs were empty, with the exception of two, in which cases I found a few minute seeds of a greenish colour. The birds were distributed almost all over the county: one was picked up near the Foundry Bridge, in this city; others at Hickling, Walton, Stalham, Woodrise, &c. I also heard of others at Lynn and Lowestoft.—*Id.*

Ornithological Notes from South Devon.—Swallows. These birds—or at least the greater part of them—left Torquay and neighbourhood on the 6th of October, although some were observed in that town as late as the 13th of November.

Pomarine Skua. Two immature birds of this species were shot in Torbay on the 12th of October.

Great Gray Shrike. I observed a bird of this species at the back of my garden on an oak tree on the 14th of October, and also on the two following days; but unfortunately I had no gun at hand on these occasions. This bird—or perhaps another of the same species—was observed by Mr. Shopland, in the beginning of November, on a tree some short distance from his house. It soon flew away, as far as I know, to be seen no more in this neighbourhood. The bird in question seemed to be a fine full-grown specimen.

Fieldfares and Redwings. Flocks upon flocks of these birds passed over my house on the morning of the 19th of October.

Velvet Scoter. A fine adult male and two females were shot in Torbay in the beginning of November.

Green Sandpiper. An adult bird was shot on Paignton beach on October 30th.

Snow Bunting. A mature bird was shot as early as the 29th of October, near Ilsham Farm, Torquay, and was preserved by Mr. Burt, curator of the Museum of this town, who kindly sent me the particulars.

Dunlin. Large flocks of these birds were observed on Goodrington Sands, Paignton, on the 2nd of November.

Albino Robin. A birdfancier in the village of Upton has a stuffed specimen of a robin entirely white, with the exception of the ends of the shafts of the primaries and tail-feathers, which are of a very light smoky gray. It was shot towards the end of last summer.

Ringed Guillemot. An adult bird was shot in Torbay on the 15th of October.—*A. de Hügel.*

Rare or New British Birds.—I think the following list of birds, all taken (except the serin finch), near Brighton, between September of the present year and the 6th of December, are worth recording in the 'Zoologist.' I have seen every one of the birds except the shore lark.

Richard's Pipit (*Anthus Richardi*). The first specimen was taken in the first week of September, the last on the 6th of December. In all I have seen eleven specimens; six of them I saw alive: some of them are doing well in confinement.

Tawny Pipit (*Anthus rufescens*). I saw a fine specimen of this bird that was shot on the 6th of September; another was killed at the same time, but was too much injured for preservation.

Shore Lark (*Alauda alpestris*). One was captured on the 16th of November, and is still alive.

Snow Bunting (*Emberiza glacialis*). Many specimens have been taken: they have been rather plentiful this season.

Scarlet Bullfinch (*Pyrrhula erythrina*). This bird was taken the last week in September: it is still alive and in good health at Mr. Swaysland's, the well-known naturalist, of Brighton.*

Citril Finch (*Fringilla citrinella*). A fine male was captured on the 20th of November. This is, I believe, only the second specimen that has been taken in this country: the first one is in the rich collection of Mr. Monk, of Lewes.

Serin Finch (*Fringilla serinus*). I saw a fine specimen that was taken in April of this year. There has been so many specimens of this species taken in this country that I think it may now be consider a British bird.

I saw also two other birds, one I believe to be a young snow finch (*Fringilla nivalis*) and the other a young male of the rustic bunting (*Emberiza rustica*). I saw both of these birds very shortly after their capture, and am quite sure of their being truly wild birds. I hope to send you shortly more particulars of these two birds.—*Frederick Bond; 203, Adelaide Road, South Hampstead, N.W., December* 15, 1869.

Angler in Torbay.—An angler (*Lophius piscatorius*), weighing about eighteen pounds, and measuring three feet two inches in length and one foot three inches in breadth (not including pectoral fins), was netted in Torbay on the 20th of November; the mouth of the fish was ten and a half inches broad, and the length of the slender filament (commonly called "fishing rod") was nine inches. These fishes seem to be rare in the bay, or they must keep in very deep water, as the sailor who brought this angler to me assured me that this was the very first of its kind he had known to be caught in the bay.—*A. de Hügel.*

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

November 1, 1869.—H. W. BATES, Esq., President, in the chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:— 'Proceedings of the Royal Society,' Nos. 113, 114; 'Journal of the Linnean Society,' Zoology, No. 46, and 'Proceedings,' 1868-69; 'Proceedings of the Zoological Society,' 1869, pt. 1; 'Journal of the Agricultural Society,' ser. 2, vol. v. pt. 2; 'Annales de la Société Entomologique de France,' 1869, pt. 1; 'Annales de la Société Entomologique de Belgique,' vols. i.—xii.; 'Mémoires de la Société de Physique, &c., de Genève,' vol. xx. pt. 1; 'Mittheilungen der Schweizerischen Entomologischen Gesellschaft,' vol. iii. Nos. 1, 2; 'Bulletino della Società Entomologica Italiana,' vol. i. pt. 3; 'Bulletin de la Société des Naturalistes de Moscou,' 1868, No. 3; 'Transactions of the American Entomological Society,' vol. ii. Nos. 1, 2; 'Memoirs read before the Boston Society of Natural History,' vol. 1, pt. 4, and 'Proceedings,' vol. xii. Nos. 1—17; 'Memoirs of the Peabody Academy of Sciences,' vol. i. No. 1; presented by the several Societies. 'Report of the Commissioner of Agriculture for 1867;' by the United States Government. 'Record of American Entomology for 1868;' by the Editor, Dr. Packard. 'List of the Lepidoptera of North America,' pt. 1, by A. R. Grote and C. T. Robinson; by the Authors. 'Entomological Notes,' Nos. 1, 2; 'Supplement to a List of the Butterflies of New England;' 'Check List of the Butterflies of New England;' 'Notes on the Stridulation of some New England Orthoptera;' and 'Catalogue of the Orthoptera of North America described previous to 1867,' by Samuel H. Scudder; by the Author. 'Entomological Correspondence of T. W. Harris,' edited by S. H. Scudder; by the Editor. 'The Canadian Entomologist, vol. i.; 'Betrachtungen über die Verwandlung der Insekten im Sinne der Descendenz-Théorie,' von F. Brauer; 'Notes sur les Neuroptères de Mingrélie,' par le Baron de Selys Longchamps, et par R. M'Lachlan; by R. M'Lachlan, Esq. 'Coleopterologische Hefte,' No. 5; by the Editor. 'Sepp, Nederlandsche Insecten,' vol. ii. Nos. 17—38; by M. Snellen van Vollenhoven. 'Synopsis des Scolytides,' by the Author, Dr. Chapuis. 'Exotic Butterflies,' Parts 71, 72; by W. W. Saunders, Esq. 'Lepidoptera Exotica,' pt. 2; and 'Cistula Entomologica,' pt. 1; by E. W. Janson, Esq. 'Descriptions of some New Species of Lamiidæ,' by the Author, F. P. Pascoe, Esq. 'Considerations on the Neuropterous genus Chauliodes and its allies;' by the Author, R. M'Lachlan, Esq. 'On the Ailanthus-feeding Silkworm;' by the Author, W. F. Kirby, Esq. Three Tracts by the Baron de Chaudoir; seven by Prof. Ballion; and twenty-two Tracts by M. H. Lucas; presented by the Authors respectively. 'The Zoologist,' August to November; by the Editor. 'The Entomologist's Monthly Magazine,' August to November; by the Editors.

The following additions by purchase were announced:—'Beschreibung europäischen Dipteren,' von Hermann Loew; erster Band. 'Bericht der Entomologie während der Jahre 1865 und 1866,' von Dr. A. Gerstaecker; zweite Hälfte.

Exhibitions, &c.

Mr. Janson, on behalf of Dr. Power, exhibited the following seven species of Coleoptera, all new to the British list:—(1) Triarthron Maerkelii, *Schmidt*, taken near Esher, 23rd July, 1869 (also taken by Mr. Oliver Janson, at Shirley, on the 7th August); (2) Silvanus similis, *Erichson*, at Esher, 4th August, by sweeping; (3) Niptus gonospermi, *Duval*, twelve or fourteen specimens taken by Mr. J. B. Syme on an old wall in the Orkneys; (4) Bruchus lentis, *Boheman*, at Birch Wood in May, and Gravesend in June; (5) B. nigripes, *Gyllenhal* (which in Kraatz's new Catalogue is said to be B. viciæ, *Oliv.*), at Devil's Dyke, Brighton, in May; (6) B. nubilus, *Boheman*, near Surbiton and at Gravesend, in June (this in the Stettin Catalogue is said to be B. luteicornis, but in Kraatz's new Catalogue it is made a distinct species; it differs much in the form of the thorax, markings, size, &c., and is more like B. seminarius); (7) B. canus, *Germar*, at Gravesend, in June (this in the Stettin Catalogue is made identical with B. cisti, *Fabr.*, but it differs from ordinary specimens of that species in the shape of the thorax, length of antennæ, more elongate form, and peculiar gray colour; it is more like B. loti: a specimen in the European collection of the British Museum, named by Germar and deposited by Walton, agrees exactly with the Gravesend specimens). All these four species of Bruchus were found in essentially wild places, far removed from granaries or depositories of leguminous seeds, and were all taken fortuitously by sweeping. And lastly, Phratora cavifrons, *Thomson*, taken at Esher in June, also at Cowley and Darenth, on poplars: introduced into the British list by Dr. Sharp, in Ent. Mo. Mag. v. 100.

Mr. F. Smith exhibited Meloe rugosus of Marsham (= autumnalis of Leach, punctatus of Stephens), a species not captured for the last thirty years, but formerly taken, according to Stephens, near Margate. About three weeks previously Mr. Smith, being near Prittlewell, Essex, went to the nest of a species of Anthophora, in which M. proscarabæus and other species are usually found, and by accident came upon a couple of dozen specimens of M. rugosus among grass in the neighbourhood of the nest, crawling about at the roots: he hoped to have kept them alive, but on the second day of their captivity an indiscriminate fight was commenced, in which both sexes joined; only four escaped mutilation, all the rest losing legs and antennæ and being reduced to fragments: the abdomen of each of the females was afterwards opened, and it appeared that with one exception all had deposited their eggs, which rendered their pugnacity still more remarkable. A subsequent visit to the same locality yielded five more specimens of the beetle. It was observable that this made the fourth species of Meloe found in the nest of the same kind of bee.

Mr. Grut exhibited some Coleoptera captured by M. Théophile Deyrolle near Trebizonde, including four new species of Carabus, C. robustus, C. ponticus, C. Theophili, and C. Gilnickii.

Mr. M'Lachlan exhibited the transformations of Mantispa pagana, which had been discovered by Dr. Brauer, of Vienna. The species was parasitic in the nest of a spider (Lycosa): the young larvæ were of the ordinary Neuropterous type, but when nearly full grown their legs almost disappeared, and the larvæ were reduced to almost footless maggots: the pupa was enclosed in a cocoon, and was of the ordinary Neuropterous form, like the Hemerobiidæ, to which doubtless the Mantispidæ were closely allied. Now that the habit of one species had been detected, it might be anticipated that the whole genus Mantispa would prove to be parasitic on spiders;

the eggs were probably laid in the egg-bag of the spider, and the larvæ would feed on the young spiders, or perhaps in their early stage on the eggs.

Mr. Albert Müller exhibited a large number of galls on various plants, and called particular attention to two kinds of excrescence on the leaf-stalk of the maple (*Acer campestre*), described in the following note:—

"*Firstly.* A Dipterous gall formed by a slender, club-like, reddish swelling of the petiole, sometimes in its middle, sometimes at its junction with the leaf; cell one, occupying the whole length of the gall, and tenanted by the white larva of a Dipteron as yet unknown to me, but which I am certain is *not* a Cecidomyia. In September, 1868, and again in the same month this year, I met with this gall on the identical maple-bush in a hedge-row near Shirley, but until now all my attempts at rearing the fly have utterly failed.

"*Secondly.* Also on the petiole of the maple-leaf, a series of spur-like, solid red excrescences, standing in a row, each about half a line high. These I am inclined to attribute to the same Acarus aceris of Kaltenbach which causes the well-known pear-shaped red galls on the leaves of this tree. But whether this be so or not, it is at any rate worth while to point out, that insect agency can produce, on thornless plants, excrescences closely resembling, or perhaps identical with, the natural thorns so commonly met with in other groups of the vegetable kingdom."

Mr. Müller mentioned that the collection of galls formed by the late Mr. Wilson Armistead had been placed in the Museum of the Leeds Philosophical Society.

Mr. Cutter (who was present as a Visitor) exhibited, on behalf of Mr. Christopher Ward, several Diurnal Lepidoptera, including the female of Ornithoptera Brookeana, various species of Charaxes, Papilio Zalmoxis, and a specimen of Papilio Antimachus, captured one hundred and fifty or two hundred miles inland from Old Calabar. Of this gigantic and remarkable butterfly the only example hitherto known was collected by Smeathman for Drury a century ago, was figured by Drury and by Donovan, and was finally taken with Drury's collection to Australia by William Sharp Macleay.

Mr. Butler corrected an error in his paper (Tr. Ent. Soc. 1869, p. 273), where it is stated that Argynnis Aglaia and Niobe show every sign of being one and the same species; for Aglaia read Adippe. And as to the occurrence of the form Niobe in Britain, see Newman's 'Entomologist,' iv. 351.

Mr. Wormald exhibited a small box of butterflies sent from Shanghai by Mr. W. B. Pryer. Amongst them were Argynnis Midas, and a beautiful species of Anthocharis with falcate wings, apparently identical with the Japanese A. Scolymus.

Mr. Dunning exhibited half a dozen moths bred and sent by Mr. E. Holdsworth, of Shanghai. One was Heterusia remota (Walker, Cat. Lep. Het. B. M. p. 431), the larvæ of which were found by Mr. Holdsworth in great numbers at Van Vun, about six miles west of Soochow: the cocoon was described as "of very white colour, and of a very paper-like nature." The other specimens were the subject of the following extract:—

"The specimens of a Bombyx have been reared by myself. from larvæ found feeding upon pine and dwarf oak at the hills near Van Vun. The larvæ when found were full grown, and hundreds of them had already spun their cocoons amongst the needles of the pine trees, and so plentiful were they that every tree had three or four cocoons on it. The following is a description of the larva as it appeared shortly before spinning its cocoon. *Body.*—Ground colour black or dark brown, covered with very short lightish brown hairs, having a lighter shade towards the sides; down the back two lines of small tufts of hair, half black and half white, placed on each segment; along the sides, tufts of fine hair, bushy at the base and of a lighter shade there, almost white, the hair getting gradually longer towards the head, where it is fully one-fourth of an inch long; round the head a fringe of short light brownish hair; on the second and third segments are two tufts of hair, reaching across the back from side to side, the front half of a deep velvetty red-brown colour, the rear half white; on the sides of the first, second and third segments are small brown tubercles. *Head.*—Large, round, with flat front. *Legs.*—Red-brown, the pro-legs reddish brown of velvetty appearance, the two last legs (anal segment) formed like a lappet. The larvæ were found in the first week in May, and spun up immediately after; the moths came out in the last week in May."

The five specimens had been examined by Mr. F. Moore, and after comparison with the British Museum collection were returned to Mr. Dunning with the following names:—(1) a female specimen, Oeona punctata (Walker, Cat. &c., p. 1418), and two males, probably of the same; (2) a female, Lasiocampa remota (Walker, Cat. &c., p. 1439); and (3) a male, Lebeda hebes? (Walker, Cat. &c., p. 1462). It remains to be ascertained whether Mr. Holdsworth confounded distinct kinds of larvæ, or whether Mr. Walker in the same volume described one species under three different names and as belonging to three different genera.

The President exhibited a coloured drawing of a large larva, found by Mr. Henry Birchall on the trunk of an Avocado pear tree in the province of Mariquita, New Granada, the whole appearance of which closely simulated that of one of the most poisonous snakes of the country, the anterior segments being dilated and having a large pupillate spot on either side representing the eye of the snake. The moth was not reared, but it was doubtless a Chœrocampa. The President had already recorded the occurrence of a similar snake-like larva in Trans. Linn. Soc. xxiii. 509.

Mr. Fry mentioned that he too had seen in Brazil larvæ resembling snakes of the country.

Prof. Westwood read the following note by Prof. Stål, of Stockholm, on the entomological collections existing in Sweden, which contain the type specimens of Swedish authors:—

"At the Museum of Stockholm we have the following type collections of insects—

(1) The collection of De Geer (types to his 'Mémoires').

(2) The types to Paykull's Monogr. Histeridum.

(3) " Paykull's Fauna Suecica.

(4) " Paykull's Monogr. Staphylinorum.

(5) " Fallén's Diptera Sueciæ.

(6) " Schönherr's Gen. et Spec. Curculionidum.

(7) " Schönherr's Synonymia Insectorum (the species described from Schönherr's collection).

(8) The types of the species which Gyllenhal described in Insecta Suecica from Schönherr's collection.

(9) Types of Dalman.

(10) " Fries.

(11) " the species which Billberg described in Nov. Act. Reg. Soc. Sci. Upsal. vii. 272.

(12) Types of Billberg to the species described in Monogr. Mylabridum from Schönherr's collection.

(13) Types of a number of species described in Sahlberg's Nov. Ins. Species from Schönherr's collection.

(14) Types of Boheman.

(15) „ Stål.

(16) „ Holmgren's Ichneumonidæ.

(17) „ Thomson's Proctotrupidæ.

(18) „ Wallengren's Lepidoptera.

"Of these the types of De Geer, Paykull, Fallén, Schönherr, Billberg, and Sahlberg, and the types of Dalman which were described from Schönherr's collection, are separated from the chief collections of the Museum.

"In Stockholm are also the types of the species described in the 'Voyage of the Eugenie,' and in the various papers on South African insects collected by Wahlberg.

"In Upsala are the following collections—

(1) The types to Linné's Museum Ludovicæ Ulricæ.

(2) The collection of Thunberg.

(3) The collections of Gyllenhal (containing the types to his Insecta Suecica, and various types to Schönherr's Synonymia Insectorum).

"In Lund there are

(1) The collections of Zetterstedt.

(2) „ of Dahlbom.

(3) „ of Thomson.

(4) „ of Ljungh.

"Thomson's collection is private: the others belong to the University.

"These are, I think, all the collections in Sweden containing types of Swedish authors."

Prof. Westwood added that at Copenhagen the collections of Westermann are preserved intact in a special room of the Museum.

Paper read.

Mr. W. F. Kirby communicated a paper "On the Diurnal Lepidoptera described in Gmelin's edition of the Systema Naturæ."

New Parts of 'Transactions.'

Part 4 of the 'Transactions for 1869' (published in July), and Trans. Ent. Soc. 3rd ser. vol. 3, part 7 (the conclusion of the volume on Malayan Longicorns, published in October), were on the table.

November 15, 1869.—H. W. BATES, Esq., President, in the chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:— "Catalogue of Scientific Papers," Vol. iii.; presented by the Royal Society. Nine Tracts, by Dr. Leconte; presented by the Author.

By purchase:—Gemminger and Harold, 'Catalogus Coleopterorum,' Vol. 5.

Election of Members.

The following gentlemen were severally ballotted for, and elected :—As Members, Messrs. D. J. French, of Chatham ; and C. G. Websdale, of Barnstaple : as Annual Subscribers, Messrs. S. J. Barnes, of Birmingham ; N. E. Brown, of Reigate ; E. M. Janson, of Chontales, Nicaragua ; O. E. Janson, of Highgate ; W. H. Pearson, of Birmingham ; and W. Douglas Robinson, of Dalbeattie.

Exhibitions, &c.

Mr. F. Smith, on behalf of Mr. Edwin Brown, exhibited a locust, several specimens of which had been quite recently captured at Burton-on-Trent: it appeared to be identical with a species of which the British Museum possesses five examples from North Bengal. The specimen exhibited was found in the yard of a brewery; and Mr. M'Lachlan suggested that it had probably been introduced in an empty returned ale-cask.

With reference to a recent article in the 'Annals and Magazine of Natural History,' in which Mr. Andrew Murray contends that Rhipiphorus is not a parasite, but only an inquiline in the nests of wasps, Mr. F. Smith desired to recall attention to the observations of the late Mr. S. Stone, recorded in Proc. Ent. Soc. 1864, pp. 62—66. On p. 64, Mr. Stone stated that on opening the closed cells of a nest of the common wasp, he had found a larva of Rhipiphorus firmly attached to the full-grown larva of the wasp, the mouth of the former buried in the body of the latter just below the head; and that in forty-eight hours it consumed every particle of the wasp-larva with the exception of the skin and mandibles. In another nest, which was destroyed by means of gas-tar, Mr. Stone also discovered a small larva of Rhipiphorus firmly attached to its victim, so firmly that when immersed in spirits they remained attached just as they were before death. This identical pair, preserved in spirits, and still *in situ*, was exhibited by Mr. F. Smith, together with numerous other larvæ and pupæ of Rhipiphorus which were placed in his hands by Mr. Stone. One of Mr. Murray's objections to the carnivorous propensity of Rhipiphorus was the fact that he had found the pupa of Rhipiphorus and the pupa of the wasp in the same cell : it appeared, however, that both were of stunted growth, and it was a matter of common experience that larvæ occasionally spin up before they are full fed, even when food is obtainable, which might have been the case with this Rhipiphorus larva: the attacks of parasites are not always fatal, but many Hymenoptera appear as well as their parasites, *e.g.* Stylops and the bee. Having regard to the known carefulness and accuracy of observation of Mr. Stone, Mr. F. Smith, notwithstanding certain difficulties raised by Mr. Murray which he was not at present prepared to explain, did not hesitate to re-affirm his belief that Rhipiphorus is a larvivorous parasite, and not a mere guest which enters the nest of the wasp and shares the food of the legitimate occupants.

Mr. Pascoe exhibited some Australian Heteromera, including new species of Helæus, Byrsax, Seirotrana, &c., and two new genera. One species of Saragus (undescribed, and for which the name S. floccosus was proposed), was remarkable from being covered with a peculiar fungoid growth, which was said by the captor to occur on the living insect, and also (or a similar growth) on the trees which the beetle frequented. This growth had been examined by Mr. Currey, and was pronounced to be truly fungous, in fact an Isaria, the early stage of a Sphæria. Several specimens of the Saragus had been seen, all with the Isaria in the same stage of development.

Mr. Wallace enquired whether the supposed fungus had been microscopically examined, as it seemed highly improbable that a living animal should habitually have a living vegetable growing on it. More probably, if it really existed during the life of the beetle, it was a natural animal growth: an allied species has a hairy covering, and it was but one step further for a hairy covering to assume a fungoid appearance, a protective resemblance to the fungi or lichens growing on the trees upon which the beetle was found.

Mr. Albert Müller made some observations on the scent, when handled, of Cynips lignicola and another species which forms a gall on the under-side of oak-leaves: this scent was probably protective, and gave the insect an immunity from the attacks of birds, &c., and the rapid spread of Cynips lignicola over the country might be due to its rejection on account of its peculiar odour.

Mr. J. Jenner Weir added that the musk beetle was free from attack by birds, and this was doubtless due to its scent.

Mr. Salvin exhibited six species of Clothilda, in illustration of the paper mentioned below.

Mr. Briggs (who was present as a Visitor) exhibited a specimen of Deiopeia pulchella, captured near Folkestone on the 1st of October: its habit was to fly only a few yards at a time, and its appearance on the wing was described as resembling one of the Geometræ.

Mr. Davis (who was present as a Visitor) exhibited a large number of preserved larvæ of Lepidoptera; amongst them a series of Cossus ligniperda, of all ages, in willow-stems, preserved *in situ;* and a larva of Sphinx populi to which were attached a number of pupæ of some parasite. There were also a few dried larvæ of saw-flies.

Mr. Dunning referred to the swarms of insects of various kinds which had been reported during the autumn: he had himself encountered hosts of Coccinellæ (principally C. 7-punctata, but intermixed with a considerable number of C. bipunctata) both in Essex and in Yorkshire; and at Walton-on-the-Naze, on the 24th of August, he fell in with a countless swarm of Syrphi, which appeared to have all hatched simultaneously and to have at once commenced buzzing about in the hot sunshine in a foolish kind of way, without caring to take food, for most of them seemed to be mere shells without any substance inside. Noticing that Mr. Horne had recorded (Newman's Entomologist, iv. 356) the occurrence of a swarm at Margate on the same day, which was said to have included specimens of Syrphus balteatus, S. decorus, S. tæniatus, S. topiarius and Eristalis tenax?, Mr. Dunning placed in the hands of Mr. Verrall, for examination, a few remnants of the Walton swarm, and had been favoured with the following note:—

"Having looked closely through the Diptera you sent me, I find that out of fifty-six or fifty-seven specimens which I can recognize from the fragments, there are twenty-seven Syrphus ribesii, sixteen S. corollæ, eight S. pyrastri, two S. luniger, one S. balteatus, one or two S. vitripennis?, and one S. pyrastri, *var.* unicolor. This last variety is generally rare, but has this year appeared in tolerable abundance. The specimens of S. vitripennis are in such condition that I cannot speak for certain about them: they may be small examples of S. ribesii."

Mr. Dunning remarked that only one name, S. balteatus, was common to the lists of Mr. Horne and Mr. Verrall, so that, if all were correctly named, no less than ten or twelve species of Syrphus occurred in the swarm on the S.E. coast on the 24th of August.

Mr. Verrall added that S. balteatus was rare in swarms; S. decorus he believed to be a discoloured variety of S. auricollis; S. topiarius, if British, was extremely rare, and did not occur in the Collections of the British Museum or the Entomological Club; and if Eristalis tenax occurred in a swarm of Syrphidæ, it could only have got there accidentally, as it might appear anywhere else from its universal distribution. He had once come upon the tail end of a swarm of Syrphidæ, and the stragglers seemed to be nearly all S. auricollis and its *var.* maculicornis.

With reference to the swarms of Coccinellæ, the President and Mr. M'Lachlan remarked that in this case there was no necessity to have recourse to the hypothesis of immigration, as they had both noticed, previously to the appearance of the beetles, an unusual quantity of the larvæ of Coccinellæ in the southern counties of England: the simultaneous hatching of a large number in one locality caused a scarcity of food there, and compelled many of them to move elsewhere; arriving at the sea-coast the majority were stopped, whilst some, attempting to go further, fell into the sea and were washed back with the tide. The littoral phænomena of the swarms were thus sufficiently accounted for. Mr. M'Lachlan added that the larvæ of Coccinella would eat the pupæ of their own species (see Ent. Mo. Mag. iii. 97); and Mr. Janson mentioned that, during the present season, he had had an apple-tree completely covered with black Aphides (commonly called American blight), the whole of which were cleared off in three or four days by Coccinella 7-punctata.

With reference to various letters which appeared during the autumn in the daily papers, Mr. J. Jenner Weir said that the "fireflies" reported at Caterham were the males of the common glow-worm; and Mr. F. Smith mentioned that he had a number of so-called "glow-worms" sent to him from Margate, which proved to be larvæ of Telephorus.

Mr. Pascoe remarked that, though insect-swarms were not common on or very near to the surface of the earth, there must be a great abundance of insect-life in the upper atmosphere; the destruction of insects at a considerable elevation by swifts must of itself be enormous.

With reference to the height to which insects may attain, Mr. Albert Müller recalled the fact, recorded by Mr. F. Walker (Entom. Weekly Intell. vii. 76), of the discovery of a Chlorops lineata enclosed in a hailstone which fell during a storm on the 18th of July, 1859.

Papers read.

The following papers were read:—

"New Genera and Species of Coleoptera from Chontales, Nicaragua," by the President.

"Descriptions of New Genera and Species of Hispidæ; with Notes on some previously described Species," by Mr. J. S. Baly.

"A Synopsis of the Genus Clothilda," by Mr. Osbert Salvin.—*J. W. D.*

30 DE69

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On the Natural History and Hunting of the Beaver on the Pacific Slope of the Rocky Mountains, by Ashdown H. Green, Esq. With Supplementary Notes by Robert Brown, Esq., F.R.G.S., 1961.

On the Immigration of the Gray Phalarope, and the Recent Occurrence of this Species in Sussex, *J. E. Harting, F.L.S., F.Z.S.*, 1972.

Ornithological Notes from North Lincolnshire, *John Cordeaux*, 1976.

SUCKLERS.—Hedgehog and Rabbit, *Henry Doubleday*, 1979. Otter near Ipswich, *H. M. Wallis*, 1979. The Australian Wild Horse, 1980.

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FISHES.—Angler in Torbay, *Baron A. de Hügel*, 1984.

Proceedings of the Entomological Society, 1985.

TO CORRESPONDENTS.

I have to apologise most especially to Mr. Harting, Mr. Rickards, Mr. May, Mr. Müller and Mr. Walker, for the non-publication of papers which I have had in my possession many weeks: these and several other communications are in type, and were quite intended to appear in the New Year's number, but the length to which the papers on the Beaver, and the Reports of the Entomological Society's Proceedings have extended, have unexpectedly compelled me to postpone their publication.—EDWARD NEWMAN.

THE GOAT MOTH.—A complete series of specimens of this injurious insect, in every stage, has been prepared to illustrate my paper in the November number of the 'Entomologist:' those who take an interest in insect economy are particularly invited to inspect these preparations. The caterpillars are preserved by Mr. R. L. Davis, who has similar ones to dispose of.—EDWARD NEWMAN.

AT HOME.—E. NEWMAN will be at home at No. 7, York Grove, Peckham, from 6 to 9 P.M., on the following Fridays:—January 7th, 14th and 21st; February 4th, 11th and 18th.

E. NEWMAN, PRINTER, 9, DEVONSHIRE STREET, BISHOPSGATE.